

What is claimed is:

1. (amended) A system for removing carbon monoxide from a hydrogen-containing treatment-object gas;

5 wherein the system comprises two stages of CO removers for removing carbon monoxide, the first-stage CO remover removing a portion of the carbon monoxide by methanation thereof through a catalyst reaction by a first metal catalyst comprising one or more kinds selected from the group consisting of Ru, Pt, Rh, and Pd and capable of methanating carbon monoxide, the second-stage CO remover removing the remaining portion of the carbon monoxide mainly by oxidation thereof through a further catalyst reaction involving addition of an oxidizing agent.

15 2. (amended) The system for removing carbon monoxide, according to claim 1, wherein the first CO remover includes the first metal catalyst and a first catalyst reaction condition setting mechanism for maintaining a catalyst reaction layer of the remover at a temperature required for methanation reaction of the carbon monoxide by the first metal catalyst; and

20 the second CO remover includes a second metal catalyst capable of oxidizing the carbon monoxide, a second catalyst reaction condition setting mechanism for maintaining a catalyst reaction layer of the remover at a temperature required for the oxidation reaction of the carbon monoxide by the second metal catalyst, and an oxidizing-agent supplying mechanism for supplying the oxidizing agent required for the oxidation reaction with  
25 adjustment of its addition amount.

30 3. The system for removing carbon monoxide, according to claim 1 or 2, wherein said treatment-object gas is a reformed gas obtained by reforming of fuel such as hydrocarbon, alcohol, naphtha, kerosene to be supplied as a fuel gas to a fuel cell.

4. (amended) A method of removing carbon monoxide from a hydrogen-containing treatment-object gas comprising:

5 a first step of causing the treatment-object gas to contact a first metal catalyst comprising one or more kinds selected from the group consisting of Ru, Pt, Rh, and Pd and capable of methanating carbon monoxide at a temperature where methanation of carbon monoxide takes place by the first metal catalyst so that a portion of the carbon monoxide is removed through its methanation; and

10 a second step of causing the treatment-object gas from the first step together with an oxidizing agent to contact a second metal catalyst capable of oxidizing carbon monoxide so that the remaining portion of carbon monoxide is removed mainly through its oxidation.

15 5. The method of removing carbon monoxide, according to claim 4, wherein in the first step, a reaction temperature of catalyst reaction between the first metal catalyst and the treatment-object gas is controlled to a temperature at which methanation of carbon monoxide may be promoted with restricting methanation of carbon dioxide, so as to reduce the carbon monoxide concentration of the treatment-object gas to 50% or lower of the  
20 original carbon monoxide concentration of the gas charged into this first step.

25 6. (amended) The method of removing carbon monoxide, according to claim 4 or 5, wherein in the second step, the second metal catalyst comprising one or more kinds selected from the group consisting of Ru, Pt, Rh and Pd is employed and

30 in the second step, a catalyst reaction layer is maintained at a temperature where oxidation of carbon monoxide takes place by the second metal catalyst involving addition of an oxidizing agent.

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7. The method of removing carbon monoxide, according to claim 4, 5 or 6, wherein the total amount of the oxidizing agent supplied at the second step is below 3 chemical equivalents in oxygen conversion relative to the amount of carbon monoxide originally contained in the treatment-object gas introduced in the first step.

8. The method of removing carbon monoxide, according to claim 4, 5 or 6, wherein the total amount of the oxidizing agent supplied at the second step is below the chemical equivalent in oxygen conversion relative to the amount of carbon monoxide originally contained in the treatment-object gas introduced in the first step.

9. The method of removing carbon monoxide, according to any one of claims 4-8, wherein said hydrogen-containing treatment-object gas comprises a reformed gas supplied to a fuel cell as a fuel gas.

10. (canceled)

11. (canceled)

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